

*heuglini*, which seemed to me as large and dark on the back as a Great Blackback, and has a wing-length of 405-469 mm compared to 447-523 mm (and an overall length of 64-78 cm, just as large as a goose) in the latter (Cramp and Simmons 1983). While *heuglini* normally winters further west, there is a subadult from the Whistler Collection in the British Museum (Natural History) taken on the Ganges at Patna, Bihar, on 11th March 1939, so that Meinertzhagen's bird could well have belonged to this form instead.

Heuglin's Gull is usually treated as a race of either the Herring Gull *L. argentatus*, or much more appropriately the more marine Lesser Black-backed Gull *L. fuscus*, but the breeding distribution of all these birds may overlap around the White Sea, with some intergradation along the River Volga, and *L. heuglini* is now regarded by some Russian ornithologists as a distinct species (Stepanyan 1990, Filchagov 1994). Most nominate *heuglini* appear to winter on the west side of the Indian Ocean, and the Patna bird may be the most easterly record, whereas most similar gulls wintering around the coasts of the Indian subcontinent appear to belong to its paler-backed eastern ally or race *L. (h?) taimyrensis*, which

winters eastwards to China (Bourne 1994).

The curious feature of this record is surely not that Meinertzhagen misidentified a difficult gull in his youth, but that he failed to correct the identification when he became older and supposedly wiser. Possibly he forgot about it, or thought that other people had done so, but he had a curiously dismissive attitude to mistakes. Thus, when I wrote to him in the early 1950s asking what else he saw when he made field notes on the feeding behaviour of the rare Raza Lark *Calendrella razeae* (Meinertzhagen 1952), he replied "he had nothing to add to what he had already written", when it later became notorious that he had never set foot on the only island where this lark occurs (Crocker 1989). But while in this case he may also have been unwilling to admit an error, it seems unnecessary to dismiss the record as a fraud while there is a natural explanation for misidentification available.

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#### 20. NOTES ON GROWTH AND MATURITY IN THE INDIAN ROOFED TURTLE (*KACHUGA TECTA*)

Sayaji Baug Zoo, Vadodara, Gujarat, India has been successfully breeding the Indian roofed turtle

(*Kachuga tecta*) since 1991. The first batch of seven hatchlings were maintained in an enclosure

TABLE 1

LIST OF PLANT SPECIES CONSUMED BY *KACHUGA*  
*TECTA* IN CAPTIVITY\*

1. *Coriandrum sativum*.
2. *Hydrilla verticillata*.
3. *Lemna gibba*.
4. *L. perpusilla*.
5. *Vallisneria sp.*
6. *V. spiralis*.
7. *Sagittaria sagittifolia*
8. *S. guayanensis*.

\* Listed as per preference of terrapin.

measuring 2.0 x 2.5 m.

The enclosure has a half-metre high periphery wall and the centre with 80 x 80 x 60 cu cm water with necessary slopes. The top of the enclosure is covered with wire-mesh for protection against predators.

The turtle hatchlings were daily fed with various species of plants (Table 1) in ad libitum quantity. Cockroaches, crickets and earthworms were also offered once a week, up to the age of one year. Turtles were less interested in insects and worms.

The following measurements were taken once a year: Straight carapace length (CL), carapace width (CW), plastron length (PL), shell height (H), and body weight (W) (Table 2). Four hatchlings died during the first year, possibly due to some fungal and parasite (*Ascaris*, sp.) infections.

Sexual-dimorphic features became apparent in the third year. Males had comparatively longer and thicker tails than the females. Body shape of male became oblong and female became oval during the same period.

At the end of fifth year the terrapin CL reached three times and the weight was twenty times more than the size at birth.

About the aspect of reproductive maturity in turtles, there are two divergent views among turtle workers. One is that it is related to the age of the turtle (Risley, 1938) and the other view regards the attainment of maturity to be primarily size related and not age related (Hidebrand, 1932; Cagle, 1948). The present study shows that male turtles attain maturity earlier than females, at the age of three, when average of CL was 6.5 cm. According to Verma

TABLE 2

MEASUREMENTS OF CAPTIVE HATCHLINGS OF INDIAN ROOFED TURTLE AT SAYAJI BAUG ZOO,  
VADODARA, GUJARAT. MEASUREMENT IN CM, WEIGHT IN GM.

Sample size	Date of measurement	carapace length	carapace width	Plastron length	Shell length	Body Weight	Remarks
7	Birth May 91	3.52 (3.37-3.67)	3.08 (2.95-3.17)	3.06 (2.96-3.14)	2.33 (1.96-2.20)	9.14 —	All hatchlings brightly coloured
3	May 92	5.73 (5.59-5.90)	4.86 (4.78-4.97)	5.06 (4.85-5.20)	3.25 (3.20-3.30)	36.6 (35-40)	Four hatchlings died
3	Jun 93	6.50 (6.20-6.80)	5.43 (5.20-5.70)	5.93 (5.55-6.30)	3.53 (3.50-3.55)	51.60 (45-60)	
2	May 94	7.44 (7.20-7.93)	6.03 (5.80-6.45)	6.80 (6.40-7.40)	3.90 (3.83-4.05)	71.6 (65-85)	Sexual-dimorphic features
2	May 95	8.43 (8.42-8.45)	6.70 (6.70-6.70)	7.87 (7.85-7.90)	4.32 (4.20-4.45)	103.0 (100-105)	
2	May 96	10.45 (10.0-10.9)	7.86 (7.20-8.52)	10.06 (9.70-10.42)	5.19 (5.00-5.38)	182.5 (60-205)	

Numbers in parenthesis are range



and Sahi (1996) the male attains maturity at the size of CL > 6.0 cm, which supports the present study.

The maturity in turtles is related either to age or size, and requires more study.

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## 21. RECORDS OF THE GHARIAL *GAVIALIS GANGETICUS* (GMELIN) FROM THE BARAK RIVER SYSTEM OF NORTH-EASTERN INDIA

(With one text-figure)

The Barak river and its tributaries drain the southern areas of north-eastern India, notably parts of Nagaland, Manipur, Mizoram, Tripura and the entire southern Assam (Fig. 1). The main tributaries of the Barak are the Irang, Makru, Tipai (Tuivai), Jiri, Chiri, Madhura, Jatinga, Sonai, Dhaleswari (Tlawng) with its distributary, the Katakhal, Shingla and the Longai. Near Badarpur, the river bifurcates into two - the Surma and the Kushiya and then flows through Bangladesh.

Occurrence of the gharial in the Barak river system was not reported in any of the recent publications on the species (Whitaker and Basu 1982; Singh, Kar and Choudhury 1984; Singh 1991). Smith (1931) also did not mention specifically. However, Choudhury (1989, 1992) mentioned its recent reports from a tributary of the Barak river.

An excellent account of the past abundance of the gharial in the Barak river system is found in Cooper (1951a, b). His Tepi', Macrup and Irung are now known as Tipai (Tuivai), Makru and Irang respectively, all tributaries of the Barak river. He and his companions shot a few of these reptiles in the upper reaches of the Barak and in the Tipai rivers. The first one was shot in 1906 up the Tipai river. In the twenties, he found the gharial to be "fairly

plentiful" in the upper reaches of the Barak, especially near its confluence with the Tipai. The site of confluence is known as Tipaimukh. The river Tipai marks the boundary of the present day Manipur and Mizoram states.

Although Singh (1991) mentioned the reference of Cooper (1951a, b), he mistook the Barak river system to be that of the Brahmaputra and also did not mark it on the map.

During field survey in different parts of the river basin over the past decade, I came across a few authentic reports on the species, and also visited all the recorded localities. These reports are presented chronologically.

1934-35: One gharial seen in broad daylight in Katakhal river, a tributary of the Barak river, near Matijuri in Hailakandi district, Assam. It was a large specimen, 4-5 m long (A. Mazid Choudhury, pers. comm.).

1948: One recorded in the Kushiya river, Karimganj district, Assam. The Kushiya river also marks the Indo-Bangladesh international border.

1950: One killed in the Dhaleswari river near Hartaki, about 32 km downstream of Sairang in Mizoram. The river is locally called by the Mizos as Tlawng.